

A 5-year-old boy with fever and joint pain is brought to the physician by his mother. The child was diagnosed with streptococcal pharyngitis 2 weeks ago and was treated with a 10-day course of amoxicillin. He completed the full course of antibiotics and did not miss any doses. Two days ago, he developed fever to 38.9°C (102°F) and seemed fatigued with decreased oral intake. Today he complained of right knee pain and asked to be picked up rather than walk on his own. His mother says that he has had no trauma or injury to the joint. On examination, his temperature is 39.4° C (103° F), blood pressure is 94/52 mm Hg, pulse is 106/min, and respirations are 16/min. The patient is holding his right knee in a flexed position. His knee is swollen and tender to palpation. He has significant pain with active range of motion and with weight bearing.

Laboratory results are as follows:

Complete blood count

Leukocytes	16,000/ $\mu$ L
Hemoglobin	12.0 g/dL
Platelets	260,000/ $\mu$ L

Immunologic and rheumatologic studies

C-reactive protein	62 mg/L (Normal $\leq$ 8 mg/L)
Erythrocyte sedimentation rate	44 mm/h

Blood cultures are pending. X-rays of the right knee show effusion and soft-tissue swelling. Which of the following is the most appropriate next step in management of this patient?

- ☐ A. Bed rest and ibuprofen
- ☐ B. Bone scan
- ☐ C. Empiric intravenous antibiotics
- ☐ D. Magnetic resonance imaging
- ☐ E. Right knee arthrocentesis



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- ☐ A. Bed rest and ibuprofen [6%]
- ☐ B. Bone scan [0%]
- ☐ C. Empiric intravenous antibiotics [26%]
- ☐ D. Magnetic resonance imaging [2%]
- ☒ E. Right knee arthrocentesis [66%]



Features of septic arthritis in children	
Clinical manifestations	<ul style="list-style-type: none"><li>• Acute onset of fever and joint pain</li><li>• Fatigue or malaise</li><li>• Refusal to bear weight due to pain</li></ul>
Physical examination	<ul style="list-style-type: none"><li>• Erythema of the overlying skin</li><li>• Warmth and swelling of the joint</li><li>• Pain with active and passive range of motion</li></ul>
Laboratory findings	<ul style="list-style-type: none"><li>• Elevated WBC</li><li>• Elevated ESR &amp; CRP</li><li>• Synovial fluid WBC &gt; 50,000 cells/<math>\mu</math>L</li></ul>
Treatment	<p><b>Birth to 3 months</b> Organisms - <i>Staphylococcus</i>, group B streptococcus &amp; and Gram-negative bacilli</p> <ul style="list-style-type: none"><li>• Antibiotics - Antistaphylococcal agent (nafcillin or vancomycin), PLUS gentamicin or cefotaxime</li></ul> <p><b>Older than 3 months</b> Organisms – <i>Staphylococcus</i>, group A streptococci &amp; <i>Streptococcus pneumoniae</i></p> <ul style="list-style-type: none"><li>• Antibiotics – Nafcillin, clindamycin, cefazolin, or vancomycin</li></ul>

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This child has a high fever, right knee pain and swelling, and refusal to weight bear in the setting of leukocytosis and elevated C-reactive protein and erythrocyte sedimentation rate. These findings are concerning for septic arthritis, a bacterial joint infection that is often preceded by skin or upper respiratory tract infections. The features of septic arthritis are shown in the table.

Arthrocentesis is both diagnostic and therapeutic and should be performed as soon as possible due to the risk of permanent joint destruction. Blood and synovial fluid cultures should be obtained before administering empiric antibiotics (**Choice C**). Antibiotics



- Antibiotics – Nafcillin, clindamycin, cefazolin, or vancomycin

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Arthrocentesis is both diagnostic and therapeutic and should be performed as soon as possible due to the risk of permanent joint destruction. Blood and synovial fluid cultures should be obtained before administering empiric antibiotics (**Choice C**). Antibiotics preceding cultures can interfere with isolation of the offending organism and lead to false-negative results. Empiric therapy should be targeted at the most likely pathogens (*Staphylococcus aureus*, Group A *Streptococcus*, and *S pneumoniae*) and should be narrowed when culture data become available.

**(Choice A)** Supportive therapy with bed rest and nonsteroidal anti-inflammatory drugs (NSAIDs) would be appropriate for transient synovitis, which presents with joint pain and decreased range of motion but rarely with fever or significant laboratory derangements. Acute rheumatic fever is also in the differential diagnosis for arthritis following group A streptococcal infection and would be managed with rest and NSAIDs. However, arthrocentesis is the most important next step in management due to the risk of dangerous joint damage from septic arthritis.

**(Choice B)** Bone scans are most useful when osteomyelitis is suspected but are not part of the routine diagnostic evaluation for septic arthritis.

**(Choice D)** Although magnetic resonance imaging (MRI) is a very sensitive modality for the detection of joint fluid, it is often not readily available, requires sedation in young children, and should not delay urgent arthrocentesis. If the patient remains febrile or fails to improve after arthrocentesis and 48 hours of appropriate antibiotic therapy, MRI should be performed to evaluate for concomitant osteomyelitis.

**Educational objective:**

Septic arthritis should be suspected in children with acute onset of fever and joint pain in the setting of elevated white blood cell count, erythrocyte sedimentation rate, and C-reactive protein. Appropriate initial management consists of arthrocentesis, blood and synovial fluid cultures, and empiric antibiotic therapy.

**References:**

1. Validation of a clinical prediction rule for the differentiation between



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#### References:

1. [Validation of a clinical prediction rule for the differentiation between septic arthritis and transient synovitis of the hip in children.](#)
2. [Factors distinguishing septic arthritis from transient synovitis of the hip in children. A prospective study.](#)
3. [Pneumococcal septic arthritis: review of 190 cases.](#)